METROPOLITAN
TRANSPORTATION
COMMISSION

Joseph P. Bort MetroCenter
101 Eighth Street
Oakland, CA 94607-4700
Tel.: 510.464.7700
TTY/TDD: 510.464.7769
Fax: 510.464.7848
e-mail: info@mtc.ca.gov
Web site: www.mtc.ca.gov

BAY BRIDGE DESIGN TASK FORCE ENGINEERING AND DESIGN ADVISORY PANEL

Friday, May 29, 1998
1 p.m.
Joseph P. Bort MetroCenter Auditorium
101 Eighth Street
Oakland, California 94607

Chairperson: Joseph Nicoletti
Vice Chair: John Kriken
Staff Liaison: Steve Heminger

FINAL AGENDA

1. Welcome and introductions - Joseph Nicoletti, Chair, and John Kriken, Vice Chair
2. Approval of draft meeting record for May 18 meeting*
3. Presentation of additional information on single-tower bridge designs - Brian Maroney, Caltrans, and TY Lin design team
4. EDAP deliberations and recommendations
5. Other business/public comment

* Attachment sent to members, key staff, and others as appropriate. Copies available at meeting.

Public Comment: The public is encouraged to comment on agenda items at committee meetings by completing a request-to-speak card (available from staff) and passing it to the committee secretary or chairperson. Public comment may be limited by any of the procedures set forth in Section 3.09 of MTC's Procedures Manual (Resolution No. 1058, Revised) if, in the chair's judgment, it is necessary to maintain the orderly flow of business.
Record of Meeting: MTC meetings are tape recorded. Copies of recordings are available at nominal charge, or recordings may be listened to at MTC offices by appointment.
Sign Language Interpreter or Reader: If requested three (3) working days in advance, sign language interpreter or reader will be provided; for information on getting written materials in alternate formats call 510/464-7787.
Transit Access to MTC: BART to Lake Merritt Station. AC Transit buses: #11 from Piedmont or Montclair; #59A from Montclair; #62 from East or West Oakland; #35X from Alameda; #36X from Hayward.
Parking at MTC: Metered parking is available on the street. No public parking is provided.

Engineering and Design Advisory Panel
Bay Bridge Design Task Force

May 29, 1998 - 1:00 p.m.

Public Sign-in Sheet

NAME	REPRESENTING	ADDRESS
1. DAVE HOLMAN	CALIF. CEMENT PROMOTION COUNCIL	263 W. EL PINTADO RD. DANVILLE, CA 94526
Chentung Hsue	American Consultants	275 28th St. #432 Oakland, CA 94611-6069
2. T.Y. LIN		315 Bay St. S.F
3. Alex Scordelis	U.C. Berkely	Berkely campus
4. LEON KIMJOY	SEF/ARCH	555 Jackson St ALBANY CA
5. [illegible]	WOCA	4124 2nd ST 94607
6. DON PUCCINI	WOCA	PO BOX 101 OAKLAND CA 94604
7. MICHAEL NEWMAN	BAY BRIDGE COALITION	
8. George Leyhatt	OAKLAND'S LANDMARK PRESERVATION ADVISORY BOARD	6650 Moore Rd Oakland 94611
YEHUDA SHERMAN	EAST BAY BICYCLE COALITION	1458 GLEN RD LAFAYETTE
9. PAUL MENAKER	KORVE ENGINEERING	155 GRAND AVE
10. ——	ASSEMBLYMAN DON PERATA	299 3RD ST #100 OAK 94607
~~[illegible]~~	~~ARCHITECT~~	~~[illegible]~~

KENTFIELD CA 94904

Engineering and Design Advisory Panel
Bay Bridge Design Task Force

May 29, 1998 - 1:00 p.m.

Public Sign-in Sheet

	NAME	REPRESENTING	ADDRESS
1.	Joe Carroll	S.F. Bicycle Coalition	4034 Mill Jr Way #3 Oakland, CA 94619
2.	Jason Meggs 510/273-9288	• Bike the Bridge! Coalition • Bicycle-Friendly Berkeley Coalition	http://xinet.com/bike jmeggs@LMI.net
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

PRESS

Engineering and Design Advisory Panel
Bay Bridge Design Task Force

May 29, 1998 - 1:00 p.m.

NAME	REPRESENTING
1. SAM DIAZ (510) 790-7313	SAN JOSE MERCURY NEWS 39355 CALIFORNIA ST. #305, FREMONT 9453
2. JOYCE CHEN 650-872-2299	SING TAO DAILY 215 LITTLEFIELD AVE. SO. S.F. CA 94080
3. JD Wam (415) 243-8876	CH66 KPST
4. Nina Siegal	The New York Times (415) 642-9459
5. CHUCK LEIGHTON	KTVU Ch 2
6. Ismail Abu-Mokhtar	Caltrans
7. Twenty-inch Crank	Bicycle Liberation Radio, 104.1 FM FRIDAYS 9-MIDNIGHT
8. ~~MARIO CHAMPI~~	~~ARCHITECT~~
9.	
10.	

Two Recommendations

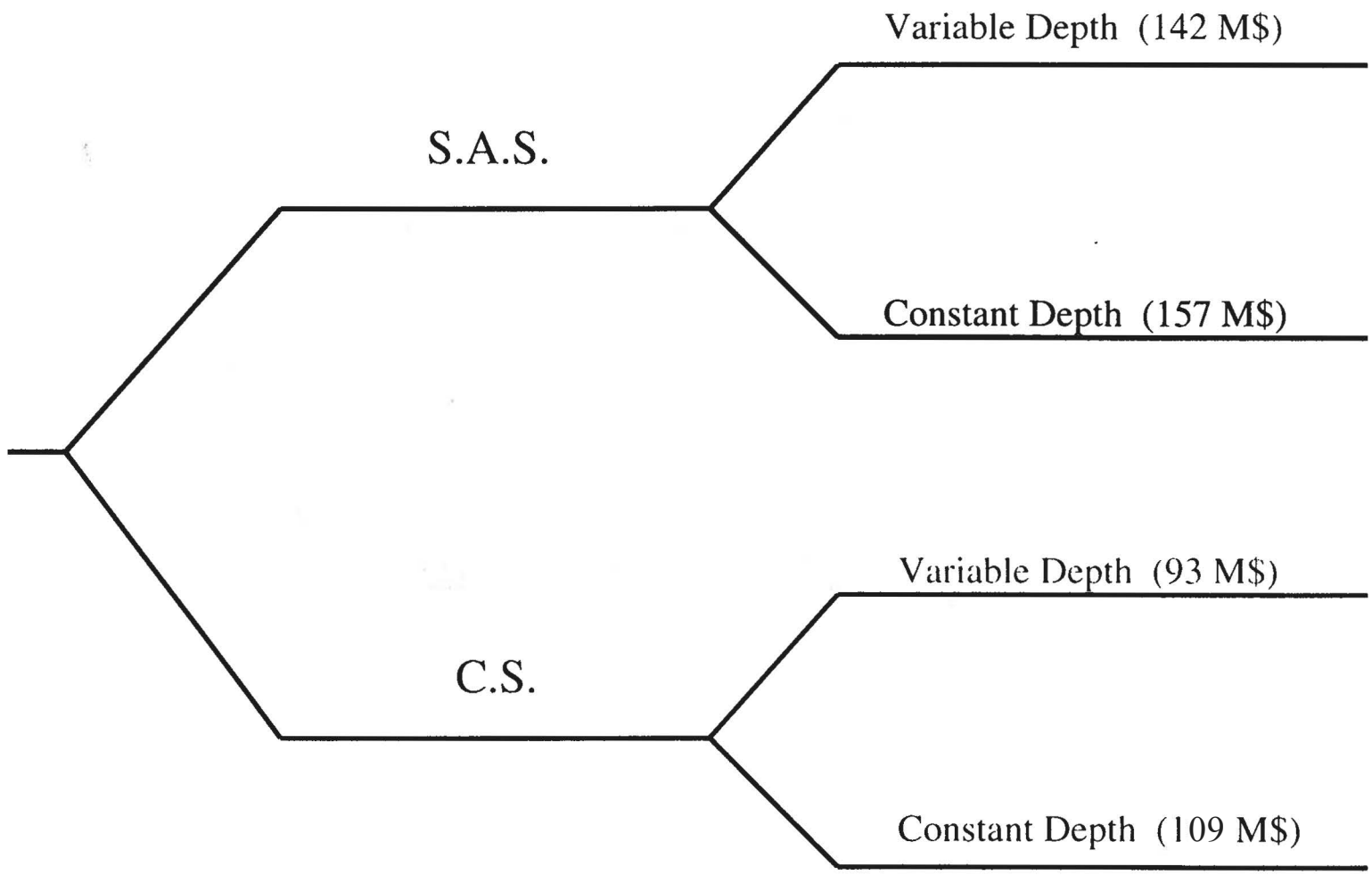
- Cable Supported Alternative and Superstructure Type

- Bicycle/Pedestrian Facility

Structure Type Decision Tree

Main Span

Skyway

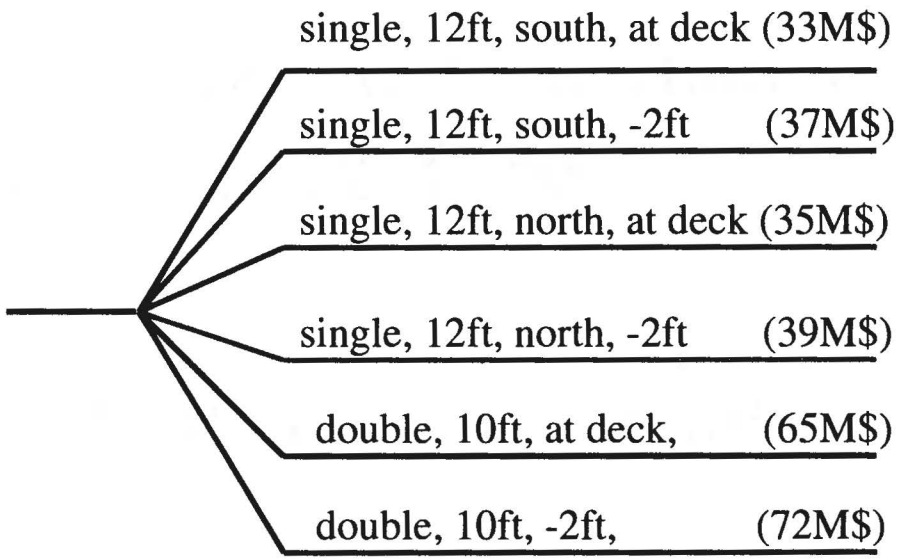


Costs are Relative at Line M

California Department of Transportation

BHM 5-98

Bicycle/Pedestrian Facility Decision Tree



Costs are Relative and similar to line M

Oakland
All-America City
1993

CITY OF OAKLAND

CITY HALL • 1333 BROADWAY • OAKLAND, CALIFORNIA 94612

Public Works Agency

(510) 238-3961
FAX (510) 238-2233
TDD (510) 238-7644

Mr. Denis Mulligan
District Division Chief, Toll Bridge Program
Caltrans, District 4
P.O. Box 23660
Oakland, CA 94623-0660

Mr. Steve Heminger
Manager, Legislation and Public Affairs
Joseph P. Bort MetroCenter
101 Eighth Street
Oakland, CA 94607-4700

May 22, 1998

Dear Mr. Mulligan and Mr. Heminger,

Thank you very much for meeting with us on May 20, 1998. In summary, the following items were discussed at the meeting and are of significant concern to the city of Oakland. The main concern being that 85% of the bridge proposal, the viaduct section, continues to look like a standard freeway overpass. We believe that you have hired qualified designers, please direct them to use their expertise and creativity to design a bridge, from shore to shore, that is deserving of the site, looks like a bridge when viewed from afar, and feels like a bridge when experienced by its users.

We are also concerned that the bridge needs to be looked at in its entirety. The bridge is being fragmented and significant decisions are being made without understanding what the potential ramifications (tradeoffs) are. For example, the constant depth deck is a pleasing idea, however, if the funds are not sufficient to provide adequate architectural features on the bridge, because of the increased cost of the constant depth design, then it may benefit us to choose the haunched deck with enhanced architectural amenities.

In addition to ensuring seismic stability and public safety, a world class design demands:

- Architectural features on the viaduct section of the bridge, above and beyond guardrails and light fixtures, that are integrated with the main span, this may include; features along the center of the bridge, overhead features, features that pick up on the "main span design" i.e. draped elements that recall the suspension's catenary curves or curvaceous elements that pick up on the curves of the cable-stayed tower.
- Architectural features that promote a sense of balance, rhythm, and cadence to the bridge while traveling on the bridge and when viewed from the shore.
- Pedestrians, bicyclists, and vehicles that feel comfortable sharing the bridge and it should evoke a boulevard or boardwalk feeling to the users.
- Open view corridors (transparent views) for public transit riders, automobiles, bicyclist and pedestrians.

- Transparent barriers; an approved (tested) and more transparent vehicular barrier, transparent guardrails for bicycle and pedestrian lanes.
- Provide a pattern, a play of marine light, overhead accentuating the design (similar to the light patterns formed off the silver trusses on the existing bridge) in addition to the patterns that will be formed from the main span elements.
- Thoughtfully designed light standards that are integrated with the overall design.
- Piers, which are significantly defining characters of the bridge, to be designed as bridge piers (v.s. freeway stilts), that are proportional relative to the overall span (as viewed in elevation) and integrated into the context.
- The deck of the bridge be reviewed in context along with the final pier design and all of the other architectural features (i.e. haunched v.s. constant depth).
- A gateway to the East Bay that pronounces your arrival on land (and departure from land)
- And lighting to further dramatize its exemplary design.

Although we recognize that these ideas may be at additional cost, the magnitude of the costs will be minimal relative to the overall expenditure of the project and if given a world class design the expense will be acceptable. Our concern is that decisions made now, for desirable features, will have a direct effect on budgeting for other pertinent elements, that will not be addressed until the next design phase.

I would like to reiterate that these are only some ideas that could help to improve upon the designs proposed. Please direct your designers to pursue multiple alternatives for review prior to EDAP making their final recommendations. We hope you are seriously considering the communities' concerns for the design of the bridge and that you will instruct the design teams to address the aforementioned issues promptly.

If you have any questions please let me know. I may be reached by telephone at (510) 238-6386. Thank you for your cooperation.

Sincerely,

Dian Tannenwald

DIANE TANNENWALD
Special Projects Manager

c: Terry Roberts, City of Oakland
Marina Carlson, City of Oakland
Helaine Kaplan Prentice, City of Oakland
Allen Ely, T. Y. Lin International/Moffatt & Nichol Engineers

Bill #60 Revised New baseline NJN (Revised)

DRAFT

COST ESTIMATE SUMMARY SHEET

		Length	Baseline Alternative: FULL SKYWAY (Original Cost for Skyway Alternative)		CABLE-STAYED MAIN SPAN STRUCTURE ALTERNATIVES (MAIN SPANS 215m & 275m)								SUSPENSION MAIN SPAN STRUCTURE ALTERNATIVES (MAIN SPANS 215m & 275m)							
					DUAL CONCRETE TOWERS				SINGLE CONCRETE TOWER				DUAL STEEL TOWERS				SINGLE STEEL TOWER			
					Haunched Concrete Skyway		Uniform Depth Concrete Skyway		Uniform Depth Steel Skyway		Haunched Concrete Skyway		Uniform Depth Concrete Skyway		Uniform Depth Steel Skyway		Haunched Concrete Skyway		Uniform Depth Concrete Skyway	
			Construction Cost	Unit Cost ($/M²)	Construction Cost	Unit Cost ($/M²)	Construction Cost	Unit Cost ($/M²)	Construction Cost	Unit Cost ($/M²)	Construction Cost	Unit Cost ($/M²)	Construction Cost	Unit Cost ($/M²)	Construction Cost	Unit Cost ($/M²)	Construction Cost	Unit Cost ($/M²)	Construction Cost	Unit Cost ($/M²)
A	MAIN SPAN*	625 m	$150,493,000	($5,016)	$240,923,000	($8,031)	$247,145,000	($8,238)	$247,145,000	($8,238)	$230,337,000	($7,678)	$230,337,000	($7,678)	$230,337,000	($7,678)	$277,418,000	($9,247)	$277,418,000	($9,247)
B	SKYWAY	2400 m	$577,893,000	($5,016)	$542,600,000	($4,711)	$556,900,000	($4,834)	$613,500,000	($5,326)	$542,600,000	($4,711)	$556,900,000	($4,834)	$613,500,000	($5,326)	$542,600,000	($4,711)	$556,900,000	($4,834)
C	TRANSITION STRUCTURE	407 m	$64,615,000	($3,307)	$50,500,000	($2,628)	$55,200,000	($2,877)	$55,200,000	($2,877)	$50,500,000	($2,628)	$55,200,000	($2,877)	$55,200,000	($2,877)	$50,500,000	($2,628)	$55,200,000	($2,877)
D	OAKLAND PLAZA	Varies	$43,095,000	($1,684)	$29,000,000	($1,577)	$29,000,000	($1,577)	$29,000,000	($1,577)	$29,000,000	($1,577)	$29,000,000	($1,577)	$29,000,000	($1,577)	$29,000,000	($1,577)	$29,000,000	($1,577)
E	YBI DETOUR STRUCTURE	Varies	Inc in Transition Structure		$49,000,000	($1,551)	$49,000,000	($1,551)	$49,000,000	($1,551)	$49,000,000	($1,551)	$49,000,000	($1,551)	$49,000,000	($1,551)	$49,000,000	($1,551)	$49,000,000	($1,551)
F	BRIDGE DEMOLITION	NA	$46,000,000	NA	$54,100,000	NA	$54,100,000	NA	$54,100,000	NA	$54,100,000	NA	$54,100,000	NA	$54,100,000	NA	$54,100,000	NA	$54,100,000	NA
G	**SUBTOTAL ($1998)**		$882,100,000		$966,100,000		$991,300,000		$1,047,900,000		$955,500,000		$974,500,000		$1,031,100,000		$1,002,600,000		$1,021,600,000	
H	ESCALATION TO 2002 @ 3%/YR		$85,000,000		$121,254,061		$124,416,883		$131,520,682		$119,923,668		$122,308,335		$129,412,134		$125,835,133		$128,219,800	
I	**SUBTOTAL ($2002)**		$967,100,000		$1,087,354,061		$1,115,716,883		$1,179,420,682		$1,075,423,668		$1,096,808,335		$1,160,512,134		$1,128,435,133		$1,149,819,800	
J	ROADWAY CONST COST		$54,000,000		$99,300,000		$99,300,000		$99,300,000		$99,300,000		$99,300,000		$99,300,000		$99,300,000		$99,300,000	
K	SUPPORT COSTS		$96,000,000		$179,604,000		$179,604,000		$179,604,000		$179,604,000		$179,604,000		$179,604,000		$179,604,000		$179,604,000	
L	CONTRACT 19 EAST RETROFIT		$5,000,000		$0		$0		$0		$0		$0		$0		$0		$0	
M	***TOTAL ESCALATED COST ($2002)***		$1,122,100,000		$1,366,300,000		$1,394,600,000		$1,458,300,000		$1,354,300,000		$1,375,700,000		$1,439,400,000		$1,407,300,000		$1,428,700,000	
N	GROUND MOTION CONTINGENCY (W/O DEMO)		$0		$102,646,403		$105,482,686		$111,853,066		$101,453,364		$103,591,831		$109,962,211		$106,754,511		$108,892,977	
O	**SUBTOTAL ($2002)**		$1,122,100,000		$1,468,900,000		$1,500,100,000		$1,570,200,000		$1,455,800,000		$1,479,300,000		$1,549,400,000		$1,514,100,000		$1,537,600,000	
P	COMPARATIVE LIFE CYCLE COST AT PV ($2002) **		$11,201,893		$13,900,000		$14,073,000		$18,232,000		$13,888,000		$14,061,000		$18,247,000		$12,229,000		$12,402,000	
Q	POST EARTHQUAKE REPAIR COST		$20,133,700		$25,594,000		$24,727,000		$28,777,000		$26,373,000		$25,506,000		$29,556,000		$25,716,000		$24,849,000	
R	**TOTAL ($2002)**		$1,153,000,000		$1,406,000,000		$1,433,000,000		$1,505,000,000		$1,395,000,000		$1,415,000,000		$1,487,000,000		$1,445,000,000		$1,466,000,000	

*Notes: 1) All Main Span Variations Incorporate an Orthotropic Steel Box Deck except the Dual Tower Cable Stay Alternative, which Uses a Concrete Box Deck 2) For Costs Relating to Future Installation of Light Rail Transit see Section 17.3

AMENITIES

INCREMENTAL COST TO ADD BIKEWAY (Based on 3.6 m Depressed Path along South Side of Structure see Section 17.7 for Other Variations.)

AA	STRUCTURE CONST	NA	$31,300,000	$31,300,000	$31,300,000	$31,300,000	$31,300,000	$31,300,000	$31,300,000	$31,300,000	$31,300,000	$31,300,000	$31,300,000	$31,300,000	$31,300,000
BB	SUPPORT COSTS	NA	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000	$1,300,000
CC	ROADWAY CONST COST	NA	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000
DD	**TOTAL COST ($1998)**	NA	$34,600,000	$34,600,000	$34,600,000	$34,600,000	$34,600,000	$34,600,000	$34,600,000	$34,600,000	$34,600,000	$34,600,000	$34,600,000	$34,600,000	$34,600,000
EE	ESCALATION TO 2002 @ 3%/YR	NA	$4,342,605	$4,342,605	$4,342,605	$4,342,605	$4,342,605	$4,342,605	$4,342,605	$4,342,605	$4,342,605	$4,342,605	$4,342,605	$4,342,605	$4,342,605
FF	***TOTAL ESCALATED COST ($2002)***	NA	$38,900,000	$38,900,000	$38,900,000	$38,900,000	$38,900,000	$38,900,000	$38,900,000	$38,900,000	$38,900,000	$38,900,000	$38,900,000	$38,900,000	$38,900,000

INCREMENTAL COST TO ADD AESTHETIC LIGHTING (Additional Cost for Upgrading Standard Safety Lighting to Aesthetic Lighting)

GG	LIGHTING COST	NA	$14,300,000	$14,300,000	$14,300,000	$13,900,000	$13,900,000	$13,900,000	$21,800,000	$21,800,000	$21,800,000	$21,800,000	$21,800,000	$21,800,000	$21,800,000
II	**TOTAL COST ($1998)**	NA	$15,060,000	$15,060,000	$15,060,000	$14,660,000	$14,660,000	$14,660,000	$22,560,000	$22,560,000	$22,560,000	$22,560,000	$22,560,000	$22,560,000	$22,560,000
JJ	ESCALATION TO 2002 @ 3%/YR	NA	$1,890,163	$1,890,163	$1,890,163	$1,839,959	$1,839,959	$1,839,959	$2,831,479	$2,831,479	$2,831,479	$2,831,479	$2,831,479	$2,831,479	$2,831,479
KK	***TOTAL ESCALATED COST ($2002)***	NA	$17,000,000	$17,000,000	$17,000,000	$16,500,000	$16,500,000	$16,500,000	$25,400,000	$25,400,000	$25,400,000	$25,400,000	$25,400,000	$25,400,000	$25,400,000

f&I~H_H~~~~s_u_P_PO—RT~C_O~STS_:_~~~+~~~~N~A~~~-|-~~~'$~75~7~,000~~~-+~~~"$~75~7~,000~~~-+~~~"$~75~7~,ooo~~~~|--~_.::$7~5~7,~000::_~~-1~~~$7~5~7,000.:.:.:.~~~__1~~~$~7~57~,000:.:.:.~~-|f--~~$~7~57~,000:.:.:.~~-+~~~'$~75~7~,000:.:.:.~~-1~~~'$~75~7~,000.:.:.:.~~-+~~~'$7~5~7,~000::_~~~;~~~~"$7~5~7,~000::_~~~-+~~~'-$7_5~7,000~~~,1

INCREMENTAL COST TO INCREASE MAINSPAN LENGTHS (Increases Suspension Main Spans to 215 m & 350 m.)

LL	STRUCTURE CONST	Not Applicable							$10,932,000 ($8582)	$10,932,000 ($8582)	$10,932,000 ($8582)	$6,365,000 ($7619)	$6,365,000 ($7619)	$6,365,000 ($7619)	
MM	ESCALATION TO 2002 @ 3%/YR								$1,372,062	$1,372,062	$1,372,062	$798,864	$798,864	$798,864	
NN	***TOTAL ESCALATED COST ($2002)***								$12,300,000	$12,300,000	$12,300,000	$7,160,000	$7,160,000	$7,160,000	
OO	COMPARATIVE LIFE CYCLE COST AT PV ($2002) **								$274,000	$207,000	$247,000	$187,000	$120,000	$159,000	
PP	**TOTAL ($2002)**								$12,570,000	$12,510,000	$12,550,000	$7,350,000	$7,280,000	$7,320,000	

** Comparative Life Cycle Costs Include only Maintenance & Repair Items whose costs differ appreciably between Alternate Design Configurations.

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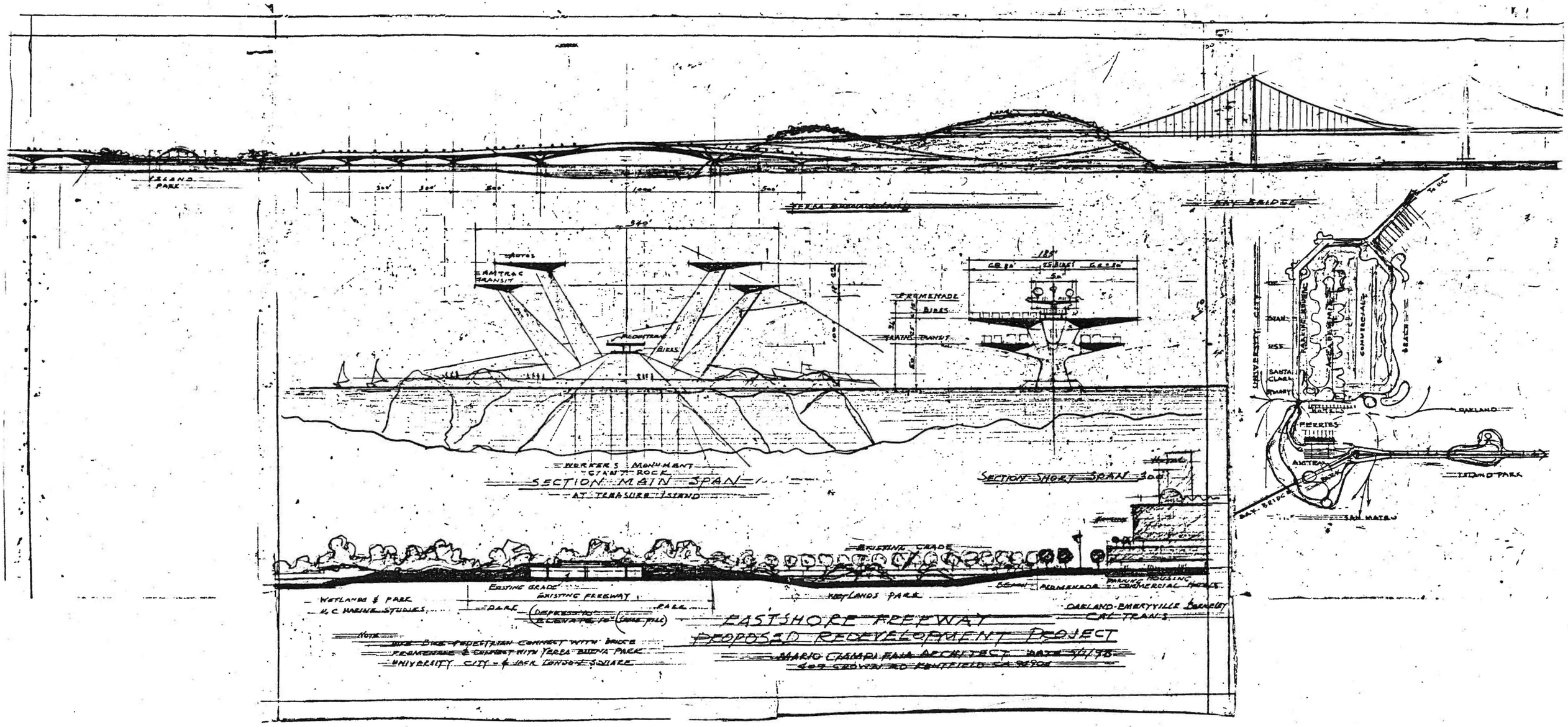
T.Y.LIN INTERNATIONAL a joint venture MOFFATT & NICHOL


YERBA BUENA ISLAND
SAN FRANCISCO-OAKLAND BAY BRIDGE
YERBA BUENA PARK
500'
1000'
500'
500'
500'
545'
AMTRAC
TRANSIT
PROMENADE
BIKES
TRANS. PLANT
185'
ROADWAY
PROMENADE
BIKES
TRANS. PLANT
BEALE'S MONUMENT
GIANT ROCK
SECTION MAIN SPAN
AT TREASURE ISLAND
SECTION SHORT SPAN 300'
EXISTING GRADE
EXISTING FREEWAY
PARK
(DEPRESS TO ELEVATE TO 2ND LEVEL FILL)
WETLANDS & PARK
U.C. MARINE STUDIES
MARSH PROMENADE - COMMERCIAL
MARINA HOUSING
OAKLAND-EMERYVILLE BERKELEY
CAL-TRANS
EASTSHORE FREEWAY
PROPOSED REDEVELOPMENT PROJECT
MARIO CAMPI FAIA ARCHITECT DATE 5/1/68
409 CROWN RD MENLO PARK CA 94025
UNIVERSITY CITY & JACK LONDON SQUARE
OAKLAND
FERRIES
AMTRAK
BART
SAN MATEO
BAY BRIDGE

WEST OAKLAND COMMERCE ASSOCIATION
P.O. BOX 23612 OAKLAND, CALIFORNIA 94623
(510) 272-WOCA (9622) FAX (510) 253-0697

May 29, 1998

Joseph Nicoletti, *Chair*
Bay Bridge Design Task Force
Engineering & Design Advisory Panel
MetroCenter
101 Eighth Street
Oakland CA 94607

Re: West Oakland Concerns

Dear Joseph:

The West Oakland Commerce Association is comprised of approximately 200 members representing the majority of businesses in West Oakland. We are concerned that, as currently conceived, the Bay Bridge replacement may prove an inadequate conduit for the needed commercial revitalization of West Oakland — clearly, the heart of the Bay Area.

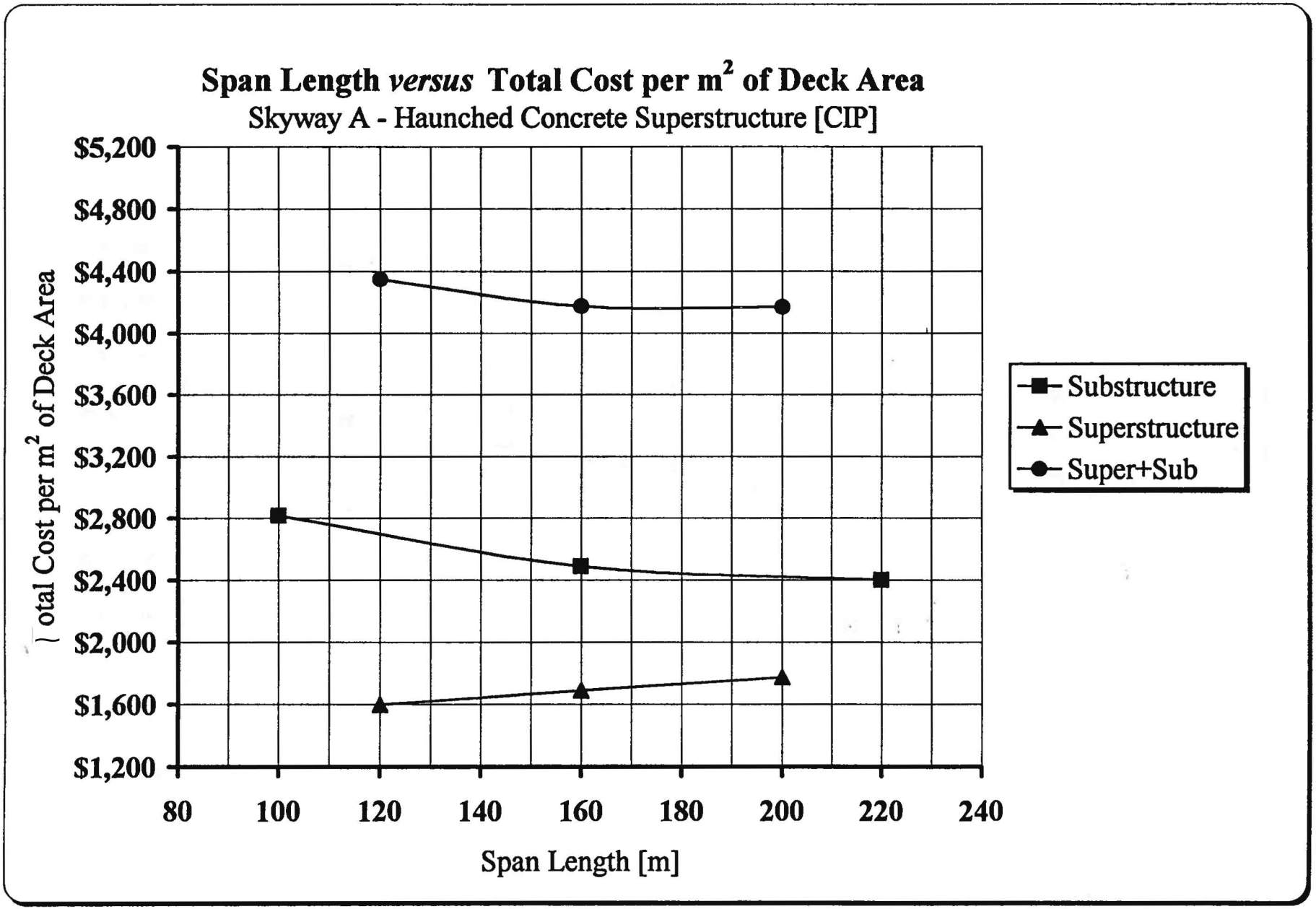
For example, we understand that no provision has been made to accommodate high speed rail, even though proper linkage between San Francisco and Oakland is obviously a critical factor in the development of the Bay Area's master plan for inclusion in the high speed rail system now being contemplated for California.

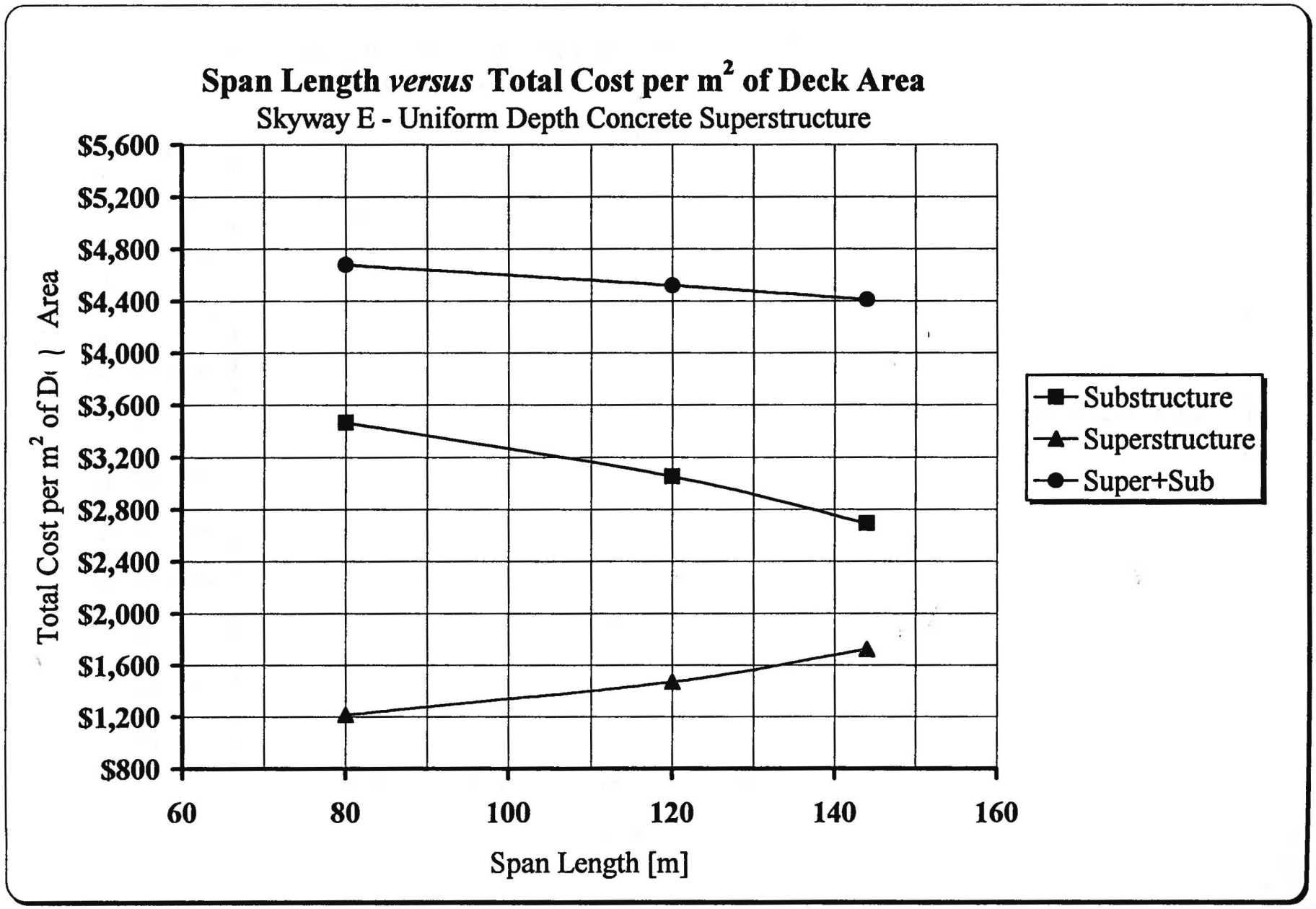
Furthermore, West Oakland has frequently experienced difficulties maintaining a cordial relationship with CalTrans, and WOCA worries that many of the same issues that surfaced during the construction of the Cypress Memorial Freeway are likely to recur, and, more than anywhere else in the East Bay, our economically circumscribed community will again be negatively impacted. As much of the trauma visited on West Oakland was directly attributable to poorly-made design decisions — dislocated egress points, willful destruction of historic artifacts, inadequate infrastructure mitigations, etc. — WOCA asks that a more stringent examination of the design criteria be forthcoming and that such criteria be mandatorily inclusive of public input from the areas most directly affected.

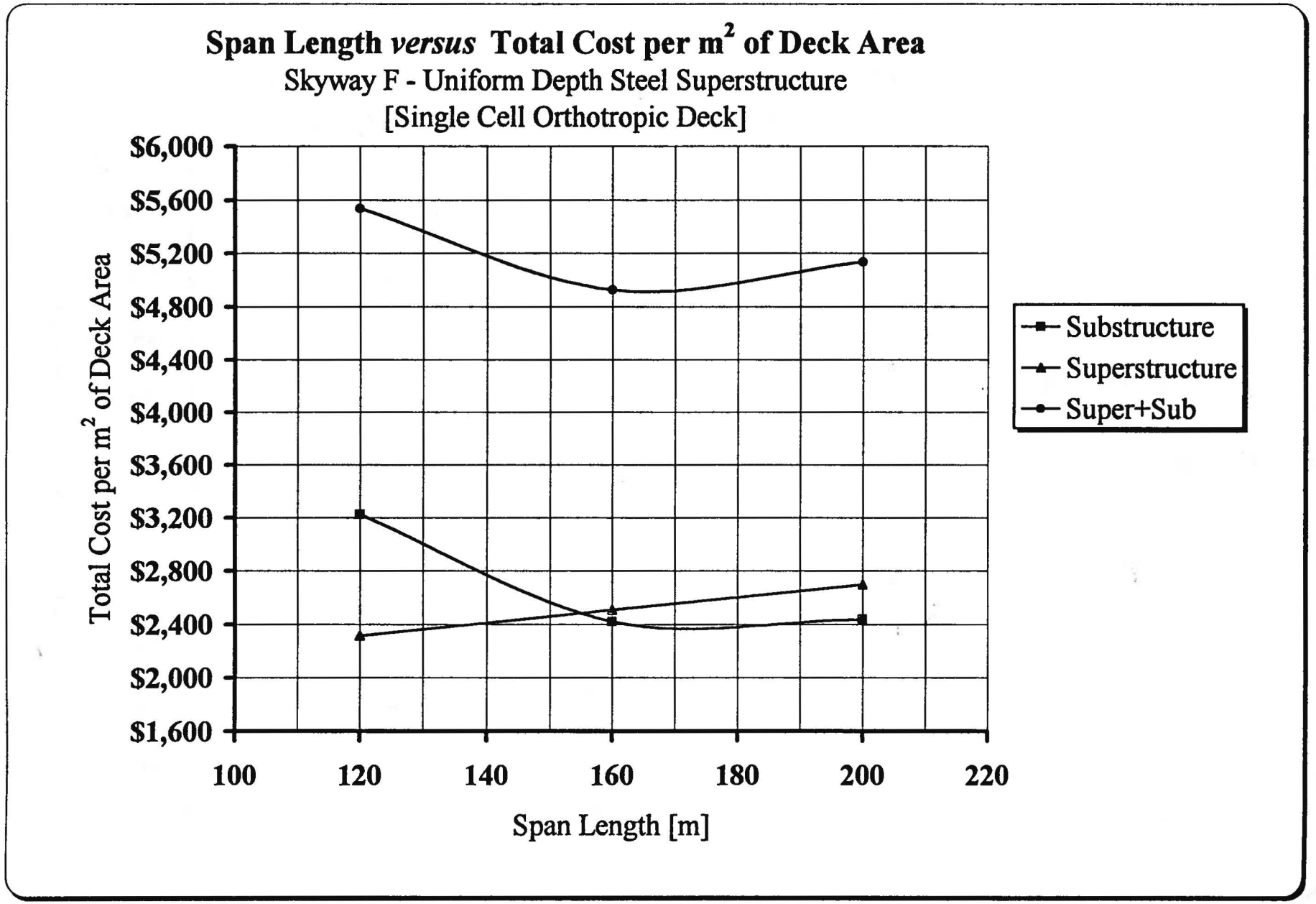
Great designwork, as opposed to the commonplace, requires that all levels of planning be considered and coordinated; and if the ghastly nightmare of Calintransigence is to descend upon West Oakland once again and create backup after backup all the way to Jack London Square, the already depressed economy of this fragile community will be pushed well beyond its breaking point, leaving future generations to look back at this moment and wonder how, with such great planning tools, such befuddlement and social tragedy could possibly have occurred.

Accordingly, WOCA must agree wholeheartedly with Public Works Agency Director, Terry Roberts, that the alternatives asked for in his May 14 letter to you be developed and, along with the additional concerns expressed in this letter, presented to your Task Force prior to any final decision as may be scheduled for June.

Cordially,
Roger Schmidt, Transportation Chair


Span Length *versus* Total Cost per m² of Deck Area
Skyway A - Haunched Concrete Superstructure [CIP]
Total Cost per m² of Deck Area
$5,200
$4,800
$4,400
$4,000
$3,600
$3,200
$2,800
$2,400
$2,000
$1,600
$1,200
80
100
120
140
160
180
200
220
240
Span Length [m]
Substructure
Superstructure
Super+Sub


Span Length *versus* Total Cost per m² of Deck Area
Skyway E - Uniform Depth Concrete Superstructure
Total Cost per m² of D( ) Area
$5,600
$5,200
$4,800
$4,400
$4,000
$3,600
$3,200
$2,800
$2,400
$2,000
$1,600
$1,200
$800
60
80
100
120
140
160
Span Length [m]
Substructure
Superstructure
Super+Sub


Span Length *versus* Total Cost per m² of Deck Area
Skyway F - Uniform Depth Steel Superstructure
[Single Cell Orthotropic Deck]
Total Cost per m² of Deck Area
$6,000
$5,600
$5,200
$4,800
$4,400
$4,000
$3,600
$3,200
$2,800
$2,400
$2,000
$1,600
100
120
140
160
180
200
220
Span Length [m]
Substructure
Superstructure
Super+Sub

Bike the Bridge!

We *still* don't know if we'll get the bike path despite these great reasons for it:

- **CHEAP** – the path is less than 4% of the total cost yet doubles the effective capacity of the bridge!
- **FAST** – cyclists will be able to cross in 15-25 minutes depending on ability. Compare that with regular 45-minute waits at the toll plaza
- **HEALTHY** – it's a healthier way to travel
- **SAFE** – a Bay Bridge trip has 2.5 times as much distance separated from automobile contact as a Golden Gate Bridge trip (and it's one-half mile closer to downtown SF!)
- **ETHICAL** – the freedom to travel at any time of the day or night, under one's own power, is a human right. Add to that that you aren't polluting and endangering, and who can refuse?

What you can do:

1) **ATTEND THESE MEETINGS**, wear your bike helmet, speak if you can! All meetings are held in the MTC Auditorium, across from Lake Merritt BART, at 101-8th Street in downtown Oakland. Call MTC at (510) 464-7700 for more information.

   a) Bay Bridge Design Task Force (BBDTF) Weds. June 10, 1 PM.

   b) Bay Conservation and Development Commission (BCDC) concerns, Thursday June 18, 10 AM

   c) BBDTF prepares FINAL recommendation for MTC. Monday, June 22, 1 PM.

   d) **THE BIG ONE!** Monday, June 24, 10 AM THE MOST IMPORTANT ONE OF ALL: The MTC decides whether to provide bicycle, pedestrian and wheelchair access. PACK THIS PLACE WITH BIKES AND CYCLISTS! Cancel your vacation, quit your job, and come on down!

2) **WRITE LETTERS/EMAILS.** Governor Pete Wilson needs to sign AB2038. Write him at Governor Pete Wilson, State Capitol Building, Sacramento, CA 95814, Fax: 916/445-4633, Voicemail: 916/658-2793 (You can press "#" to bypass the message), Office: 916/445-2841, and send the governor an email: Pete.Wilson@ca.gov. You can visit our web site for an easy way to send him a letter, just go to http://www.xinet.com/bike/ and click on the "urgents alerts" section at the top.

2) **DO OUTREACH!** Please volunteer for at least one afternoon to collect signatures and hand out flyers. Call (510) 273-9288 or email jmeggs@lmi.net to coordinate.

Bike the Bridge! Coalition, 510/273-9288, http://www.xinet.com/bike/
Printed on 100% post-consumer content, re

Bike the Bridge! Coalition
P.O. Box 15071
Berkeley, CA 94701-6071

http://www.xinet.com/bike/

510/273-9288 – Message Center
510/720-2818 – Pager, Jason Meggs, East Bay Coordinator
510/486-1528 – Facsimile c/o

May 20th, 1998

EDAP
MTC
101-8th Street
Oakland, CA 94608

Dear members of the Engineering Design Advisory Panel:

I would like to ask you to consider two designs for the bicycle/pedestrian pathway in your deliberations. This is based in large part upon the research we have commissioned which is available on the internet (http://xinet.com/bike/design/). The first design would be a wide, boardwalk-like path, recessed by at least four feet or more below deck, on the south side of the bridge. The south side is the side preferred by bicyclists for this span. Having a width of at least 15 feet but preferably 22 feet would allow multiple benefits over other options. Personal safety would be improved by increasing the population on the path. The path would consistently receive sunlight. The wideness would minimize user conflicts and negate any "tunnel effect". The view of Oakland for motorists would be unimpeded. The view for path users would be the best we can do on the south side: all the sky and bridge, none of the cars. Harassment from motorists—including throwing of objects and other attacks, which are problems on the Golden Gate—would be avoided. Emergency access to the path would not be a problem. Most importantly, separation from motorists would be maximized, and this is the strongest majority concern we have heard in our meetings and in our polling of over seven-hundred cyclists on this issue. The very real harms of air pollution and noise pollution would be mitigated considerably, both by the breaking of line-of-sight noise and by allowing such increased separation. Effects of noise must not be underestimated. At or above deck, noise has maximums above 90 dB A, eight times as loud as this pathway would ~~be causing~~ cause permanent hearing loss in path users and discourage regular path use. Folks with hearing aids would find the path especially painful. The social element of the path would be lost as a normal conversation would no longer be possible. The two drawbacks of this path are possible preclusion of Oakland's preferred haunched design, and that those who do wish to be at-deck, or who do want the northern view, would not be accomodated for. My one regret would be that motorists would not be able to see us whizzing past them on the downhill.

I would then ask you to also consider a second design, which is a compromise design and may or may not be the best of both worlds. This design would consist of two paths, one above-deck as on the Golden Gate, and one below-deck as in the aforementioned design. Pedestrians would use the north-side path and cyclists the south-side path during high-use periods, as requested by both groups. The path widths would be a preferred minimum of twelve feet. The northern path would be as high as possible, up to the height of the roadway barrier (currently 2.8 feet), which is the highest point on the bridge, affording the maximum views and helping to minimize noise and air pollution, and debris. The south-side path would benefit from the before-mentioned traits of the first design, although separation from high-speed, high-density traffic would be less. User conflicts, the most serious and ongoing problem at the Golden Gate bridge—that is, collisions between users—may well be worse for this second configuration than for the boardwalk design.

Thank you sincerely for you ongoing attention to this process and for all your support of people-access.

Sincerely,

Jason Meggs, East Bay Coordinator

BAY BRIDGE DESIGN TASK FORCE
Engineering and Design Advisory Panel
May 18, 1998 Meeting
Metropolitan Transportation Commission

Draft Record of Meeting

Panel Attendance

Joseph Nicoletti (Chair), Christopher Arnold, Bruce Bolt, Roger Borcherdt, Robert Brown, Jerry Fox, Ben Gerwick, Jeffrey Heller, Ephraim Hirsch, I.M. Idriss, Roger Leventhal, T.Y. Lin, Jim McCarty, Roumen Mladjov, Klaus Ostenfeld, Alexander Scordelis, Frieder Seible, Peter Taylor, Steve Thompson, Kuei-Wu Tsai, Edward Wilson, Thomas Wosser, and Y.C. Yang.

Approval of draft meeting record for April 15 meeting

The minutes were approved as presented. Ephraim Hirsch asked for more complete minutes to be prepared for future EDAP meetings.

Report on seismic safety issues

Bruce Bolt made a brief report on ground motions affecting the eastern span from the Hayward and San Andreas faults. He emphasized that even though the new bridge designs are being tested under maximum credible earthquake conditions, a level of uncertainty still exists with respect to the exact nature of ground motions that the new span might confront.

Frieder Seible made a brief presentation on behalf of the Caltrans Seismic Safety Peer Review Panel. He described the membership of the panel and that it had met four times this year. He presented preliminary findings in five areas, summarized as follows: (1) Bridge alignment: soil conditions vary along preferred northern adjacent alignment, and battered piles might improve foundation stability at certain locations; (2) Skyway system: all skyway systems analyzed can be designed to the same level of seismic reliability; (3) Link beams between skyway structures: there was no significant difference on pile cap displacements between linked and unlinked structures and there could be some disadvantage to linking the structures, therefore the skyway structures should not be linked; (4) Tower geometry: the cable towers for all four main span designs exceed the minimum seismic reliability needed at the site, although the panel did express concerns with the links at the top and bottom of the double portal cable-stayed bridge towers; (5) Signature bridge cable support system: the cable support systems of all four bridge designs perform well, again with exception of cable stays near the tower of the double portal cable-stayed bridge which tend to unload.

Context for EDAP recommendations

Steve Heminger of MTC summarized a written memorandum distributed at the meeting which described two important elements of context for EDAP's recommendations: (1) the 17 planning and design recommendations adopted by MTC in July 1997; and (2) the budget for EDAP's recommendations on the cable-supported main span and bicycle/pedestrian access on the new span, which is $230 million for the two items.

Presentation and recommendations on bridge design alternatives

David Goodyear and Tom Piotrowski of the TY Lin design team presented further engineering, architectural, seismic performance, and other design information on the cable-stayed bridge options, which is summarized in the draft 30% type selection report that was distributed at the meeting. At the conclusion of its presentation, the cable-stayed design team recommended the single concrete tower cable-stayed design with a uniform depth concrete skyway, single bicycle/pedestrian path, and aesthetic lighting for further consideration by EDAP.

Herb Rothman and Don MacDonald of the TY Lin design team presented further engineering, architectural, seismic performance, and other design information on the self-anchored bridge options, which also is summarized in the draft 30% type selection report. At the conclusion of its presentation, the suspension design team recommended the dual steel tower self-anchored suspension design with a 350 meter main span, uniform depth concrete skyway, single bicycle/pedestrian path, and aesthetic lighting for further consideration by EDAP.

Denis Mulligan and Rachel Falsetti of Caltrans presented draft cost information on the four bridge design options. Mr. Mulligan cautioned that the cost information for the cable-supported bridges was suitable for comparison among the four bridge design options, but should not be compared against the baseline costs reflected in Senate Bill 60 because of different cost assumptions used for the baseline bridge and the four design options. Mr. Mulligan indicated that comparative cost information for the baseline bridge and cable-supported design options will be available at the May 29 EDAP meeting. Ms. Falsetti proceeded to summarize the written cost information, which indicated that the dual tower suspension bridge recommended by one design team would cost $74 million more than the single tower cable-stayed bridge recommended by the other design team.

After the lunch break, Rafael Manzanarez of the TY Lin design team presented visual simulations of the four bridge design options and made concluding remarks on behalf of the design teams.

EDAP discussion and recommendations

Chair Joseph Nicoletti invited the panel members to make individual comments on the bridge designs recommended by the design teams and other relevant issues, which are summarized as follows:

Jim McCarty expressed surprise that the suspension bridges are estimated to take less time to build, and indicated the dual tower designs conveyed a stronger sense of stability.

Edward Wilson expressed his preference for the single tower designs of each bridge type due to the higher cost and other factors associated with the dual tower designs.

Klaus Ostenfeld also expressed his preference for the single tower designs of each bridge type, although indicating that the single tower suspension design could benefit from additional design work especially in the arrangement of the cables. He further recommended that instead of EDAP recommending concrete or steel skyway decks, that both options should be bid and the winner selected based on actual market price.

Ben Gerwick recommended that the design teams consider lowering the channel span deck so that more of the cable tower would be visible above the deck.

Peter Taylor echoed Mr. Ostenfeld's call for a bid price competition between concrete or steel skyway decks. He also expressed several other concerns, including that the proposed designs had too many piers on Yerba Buena Island, that an optimization study was needed to determine the proper span depth, and that given the large total cost of the new eastern span, the small incremental cost differences among the four cable-supported design options were not meaningful.

Roger Borcherdt indicated that all four designs appeared viable from a seismic point of view, and that the northern alignment selected has an implication for total bridge cost.

Robert Brown said he was satisfied with all the designs, but would feel more comfortable with the dual tower designs in an earthquake.

T.Y. Lin expressed a preference for the cable-stayed designs, and said that the suspension designs represented ignorance in engineering. He recounted an interesting fable which illustrated his point that the new eastern span should not copy the west suspension spans.

Alexander Scordelis indicated that the single tower cable-stayed bridge would be a great design addition to the Bay Area and that it can be built easier than the self-anchored suspension alternatives.

Roumen Mladjov expressed concern about the location of the cable towers in deep water and expressed regret that the new main span would be much shorter than the existing main span despite advances in bridge technology to enable spanning longer distances. He agreed with suggestion to bid both concrete and steel deck options, and said that a steel bridge with a composite deck would be the best alternative.

Christopher Arnold said that since the cost data was not an issue and all four designs perform well seismically, that EDAP's task essentially was to render a subjective judgment on the four bridge designs. He lauded the innovation of the single tower cable-stayed bridge and said that the dual tower suspension bridge looked like half of a catenary span, and thus seemed incomplete.

Ephraim Hirsch said he could not support the dual tower designs and that if two towers were necessary, then the two new bridges might as well be split, one north and one south of the existing eastern span. He expressed his support for moving forward with the two single tower designs, and encouraged the design teams to consider moving the tower closer to Yerba Buena Island.

Joseph Nicoletti refrained from making his own comments because of his role as chairman, but he read comments that had been submitted to him by Vice Chair John Kriken. Mr. Kriken expressed his preferences for single instead of dual towers, asymmetrical main/back spans instead of symmetrical spans, steel instead of concrete, two bicycle/pedestrian paths instead of a single path, and a depressed path instead of one at deck level, although the depressed path should be visible from the deck for safety reasons.

Jeffrey Heller noted that the cost differential among the design options was greater than the incremental cost of adding bicycle/pedestrian access. He said the single tower designs were more harmonious with the single towers of the western span, therefore he favored those designs and, between the two single tower options, he favored the single tower cable-stayed bridge. He expressed support for consistent profile for the main span and viaduct deck, but said he was willing to consider a haunched skyway if cost savings could be achieved.

Bruce Bolt indicated that the single tower designs constituted an engineering breakthrough, while the dual tower designs looked run of the mill. He expressed a preference for lengthening the main span of the suspension bridge to 350 meters.

Y.C. Yang said the Bay Area doesn't need another suspension bridge and that the cable-stayed bridge would be less expensive to construct. He also indicated that it would be more economical to use steel decks because of a surplus of steel on the market.

Frieder Seible said that progress in bridge design is measured not just in span length but in innovation, and the single towers are a major innovation. He echoed Mr. Taylor's concern about a forest of columns on Yerba Buena Island and said he strongly preferred a constant depth skyway because of the poor visual appearance of a haunched deck. He also expressed concern about the visual impact of the bicycle/pedestrian path going around the dual towers of those bridge options.

Steve Thompson expressed surprise that the 30% design stage had not revealed large cost differences among the cable-supported design options, and expressed concern about the apparently large cost difference between the cable-supported designs and the baseline bridge. He indicated a strong preference to include the bicycle/pedestrian path and suggested, given the relatively low incremental cost, that two paths would be preferable. He asked the design teams to consider lowering or modifying the barriers at the edge of the bridge deck, which obscured views in the visual simulations.

Thomas Wasser expressed a preference for the single tower cable-stayed design, but said the single tower suspension design's arrangement of cables at the inside and outside of the deck looked unsettling.

I.M. Idriss said that the panel's experience is almost irrelevant because a cable-supported bridge had never been designed to the earthquake standard of the new eastern span. He said that with two of the most beautiful suspension bridges in the world already located in the Bay Area, the dual tower suspension design was an insult to the region. He also expressed concern about the Yerba Buena Island touchdown.

Jerry Fox echoed earlier comments that the single tower designs were innovative and fit better with the western spans. He suggested that the design team optimize the span length with cost, and that the suspension team should consider placing the suspender cables to the inside of the bridge deck on the single tower design.

At the conclusion of this roundtable discussion, EDAP unanimously approved a motion to carry forward the single tower cable-stayed and self-anchored suspension alternatives for further consideration.

Public Comment

The following members of the public made comments during the public comment period:

- Terry Roberts - regarding the City of Oakland's concerns about the design of the viaduct portion of the bridge
- Jack Robbins - regarding the cost difference between the cable-supported bridges and the baseline bridge
- Bryan Foster - recommending retrofit of the existing bridge
- Lori Salamack - presenting a letter from the city administrator of Piedmont
- Marina Carlson - regarding the City of Oakland's concerns about the viaduct design
- Robert Piper - recommending the accommodation of intercity passenger rail service on the new eastern span
- Helaine Prentice - regarding the City of Oakland Landmarks Board's concern about the viaduct design
- Richard Mlynarik - regarding rail service on the new span
- Victoria Eisen - indicating the the bicycle/pedestrian advisory committee will make a recommendation to EDAP at its May 29 meeting

Bay Bridge Bicycle/Pedestrian Advisory Committee
Pathway Recommendation to the
Engineering and Design Advisory Panel
May 29, 1998

Recommendation #1
Two paths, each at least ten feet wide, approximately 12" above deck level.
Cost: On the order of $70 million.

Recommendation #2
If EDAP does not choose to include two paths in the final bridge design, then we recommend one 15-foot wide path on the south side of the new span, approximately 12" above deck level.
Cost: On the order of $48 million.

Minimum Desired Alternative
If a raised pathway is unacceptable to EDAP, we would prefer a below deck pathway in which the total height of the solid barrier plus the depression is at least six feet. This could be accomplished, for instance, by depressing the path 3-1/2 feet given a standard 2'8" concrete barrier.

Bridge Railings
The Bicycle/Pedestrian Advisory Committee recognizes that, from a motorist's point of view, the path railings need to be as transparent as possible. This is also a desirable feature from a path-user's perspective for security, viewing and a sense of openness. We have some examples of highly transparent railing infill material, as a starting point for consideration by the design team.

Please note that the Golden Gate Bridge path is 13" above the roadway. Although it has no railing between the roadway and the path, it has a dense outside railing. Interestingly, motorists do not complain that their view is impeded. This outside railing is as close to motorists as the inside railing on the Bay Bridge will be, because the new span will have a shoulder and the Golden Gate Bridge does not.

We are confident that there are a number of innovative design solutions to creatively address the railing issue. We look forward to continuing to work with the bridge designers to develop these solutions for a world class pathway.

ROSTER
Engineering and Design Advisory Panel
Bay Bridge Design Task Force

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Note: The Engineering and Design Advisory Panel of the Bay Bridge Design Task Force is comprised of representatives from the following organizations (in some instances serving on more than one panel):

- American Institute of Architects
- American Society of Civil Engineers
- Bay Conservation and Development Commission Design Review Board
- Bay Conservation and Development Commission Engineering Criteria Review Board
- Caltrans Peer Review Panel
- Caltrans San Francisco-Oakland Bay Bridge Review Panel
- Caltrans Seismic Advisory Board
- Structural Engineers Association of Northern California

Maj - File

TRANSLOG

TRANSPORTATION AND LOGISTICS CONSULTING

Post Office Box 14701
Berkeley, CA 94712
Tel & FAX (510) 848 4134

May 18, 1998

Mr. Joseph Nicoletti, Chair, and
Members
Engineering and Design Advisory Panel
Bay Bridge Design Task Force

Dear Mr. Nicoletti:

Please address MTC Planning Recommendation 8. It implies that the new east span, "will accommodate the possibility of future rail service." This is not the case.

- In the next 25 years, a million people will settle in the area east of San Francisco Bay and along the I-80 corridor to Sacramento.

- At the same time, thousands of jobs will be created in San Francisco.

- BART, the existing transbay rail link, is close to its ultimate capacity during the peaks because of dwell times for passenger boarding in San Francisco.

- The Bay Bridge is the only alternative for meeting the growth in travel demand at reasonable cost.

Caltrans admits that its design is structurally inadequate for carriage of intercity passenger trains like those in Japan, Europe, etc. Light rail (undefined) is also effectively precluded. There is no place to put it. Caltrans pretends that traffic lanes or shoulders could ultimately be replaced by light rail. Environmentalists might applaud such action but to base plans on it is a sham. Underscoring the intent to exclude rail, Caltrans and MTC staff propose to demolish the Transbay Terminal, the only San Francisco facility where rail could go.

MTC and Caltrans argue that funding to plan for rail was never legislatively authorized. Small wonder. Neither agency ever asked for it.

In your experience as architects and engineers, you have encountered clients who proposed projects that would not meet their needs. You worked with them to address the project shortcomings. If more money was needed, you told them.

The design you are being asked to endorse will be condemned by future generations, not for its appearance, but for its failure as a transportation artery. Do you wish your name to be associated with this failure? If not, I suggest that the time to speak up is now.

Sincerely,

Robert R. Piper

Robert R. Piper, Ph.D.
Principal

May 18, 1998

Dear Steve,

I had planned to speak today, but I cannot remain at the meeting beyond 1:00 P.M. Will you kindly forward my comments to the panel.

As I said at the meeting 5/13/98, I strongly support the self-anchored suspension bridge. The petitions which I submitted on that date represent over 50 professional people who either use the Bay Bridge regularly or look at it from their homes or offices. The existing World Class bridges, the Golden Gate and the Western Bay Bridge, with their beautiful catenary curves will never go out of style.

We must continue Charles Purcell's original vision. The island becomes a brief interruption — (pleasant, like Frank Sinatra taking a breath before the final words of a song!)

The attached "letter to the editor" says it rather well.

Thank you, Steve.

Sincerely,
Joan Ross

P.S. The cable stayed design would look fantastic in San Mateo or Florida.

5/15/99
S.F. Chronicle

Where's the Simple Bay Bridge Design?

Editor — Why has the simple causeway design disappeared from the selection of Bay Bridge options? I, for one, favor the design which is least obtrusive. This will detract less from the natural beauty of the bay and Yerba Buena Island. A bridge doesn't really have to make a statement, especially one which you can't really see unless you are in the middle of the bay.

In fact, why not simply rebuild what we have? It strains my credulity to accept that it would not be far less expensive and troublesome to strengthen what we have now. Your poll is not meaningful without these two rather more sensible options.

SEARLE WHITNEY
Albany

A Better View

Editor — With all the hoopla over the new design for the Bay Bridge, how come I have never seen a picture showing any of the new designs in the context of the entire bridge, including the San Francisco to Yerba Buena part?

Most of the time, when I see the bridge at all, I see the whole thing. It doesn't make sense to me to choose a design for the eastern half in isolation, without considering how it will fit in with the western half. Kind of like buying a gorgeous pink skirt without considering how it will look with that orange blouse.

YEHUDIT LIEBERMAN
San Rafael

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BAY BRIDGE DESIGN TASK FORCE
ENGINEERING AND DESIGN ADVISORY PANEL

Engineering and Design Considerations for the East Span Replacement of the San Francisco Oakland Bay Bridge

General Requirements

The new span will be constructed in a manner to allow continued operation of the existing span with a minimum amount of time upon completion to transition to the new span.

Post-Earthquake performance of the new structure should be high. The bridge will be designed to provide emergency as well as normal traffic service (lifeline service) after an earthquake on either the Hayward or San Andreas fault systems. Some damage during a large seismic event is expected — e.g., minor plastic hinging and thermal deck joints requiring replacement — that should be managed (i.e., location and quantity controlled by design). No damage in the foundation should be tolerated as it cannot be easily accessed. Even if the design plans for no damage in the system, design of a fuse for location and ductility should be completed.

The new structure should accommodate the existing level of traffic capacity (five lanes of traffic in each direction) with the addition of a standard shoulder on at least the right side in each roadway.

Geometry will be compatible with the tunnel at Yerba Buena Island and the westerly approach to the Oakland toll plaza.

Access will be provided to Yerba Buena Island (YBI). The new design should be as compatible as is reasonable with present use and future development of YBI and Treasure Island (e.g., United States Coast Guard (USCG) and the City of San Francisco island use plans)

A single clear portal 42 meters (138 feet) vertically above the mean high water level and a minimum of 143 meters (500 feet) horizontally between fenders will be provided for marine traffic over the existing navigational channel just east of YBI. (The USCG will make the final determination.)

The existing bridge will be removed after completion of the new span.

Additional considerations that may impact the design of the bridge include any height restrictions by the Federal Aviation Administration and scope changes which will be determined by the Bay Bridge Design Task Force and the Metropolitan Transportation

Commission after public hearings and in consultation with the Bay Conservation and Development Commission (BCDC) and Caltrans. These include:

- the width of the shoulder, if any, on left side of the roadways,
- the addition of pedestrian and bicycle facilities,
- the accommodation for future rail.

Structural Considerations

The design should anticipate potential inefficiencies of the foundations in bay mud (see the Caltrans' East Span of the San Francisco-Oakland Bay Bridge, Log-of-test-Borings, April 18, 1997).

For efficient span lengths and foundations, a configuration is selected by envisioning an efficient foundation design in which group efficiency is high (i.e., few piles and/or large pile spacing) and few, if any, additional piles are required for load case VII (controlling earthquake) beyond required piles for load cases other than load case VII (i.e., foundation service loads are increased by increasing span lengths until required capacities due to service loads are near to required capacities due to the seismic load case).

The above-described design process will generate several different span lengths as the soils and height of the roadway vary. If the relatively great variation in structure type of the existing east spans is to be avoided, a degree of compromise should be anticipated between economy and structure type continuity in pursuit of structure continuity.

Desired span lengths tend to define superstructure type, first by feasibility and then by economy. Minimum depth-to-span ratios must be respected in order to avoid compromising camber prediction methodologies and live load deflection limiting criteria.

On stiff sites the structural system should be soft and on soft sites the structural system should be stiff.

Bridge response to seismic ground motions are likely to be dominated by a velocity pulse. A rocking system should be considered to minimize damage and plastic deformation at the time of a pulse and following an earthquake.

Torsional capacities within the superstructure must be capable of carrying seismic demands.

Drop-type vulnerabilities should be avoided and elimination should be considered.

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Structural design should consider modern materials, construction techniques and seismic devices. The type selection should respect constructability and the capacity to maintain quality assurance.

An economical solution is an important consideration in type selection.

Design Considerations

The bridge should integrate into the site and the surrounding environment by reflecting the grand scale of the San Francisco Bay, by harmonizing with the existing west span of the bridge and by landing gracefully on the Oakland and Yerba Buena Island landfalls. The replacement bridge should by contrast or similarity, compliment the existing San Francisco bridge suspension span. They should feel related in some way that makes the two bridge elements into a whole. One bridge should not diminish the visual quality or importance of the other.

The design of the replacement span should adhere to the established principles of design so that the structure's form, alignment, and detailing exhibit continuity and order. Where spans or structural systems change within the new east span, structural system integration will be important for visual continuity.

The new bridge should be visually memorable and convey a sense of the gateway to Oakland. Views from the bridge when traveling toward Oakland should consider Oakland's central business district and waterfront.

The bridge should convey to the user that the user is on a bridge and not an extension of the on-grade highway system. There should be some visual expression of the long span bridge section to the user.

The bridge should provide a measure of visual continuity for motorists regardless of what structural system is used equal to, but not necessarily the same as, that of the existing westbound portion of the east span bridge.

The girders, piers and rails of the bridge should generally appear slender and should provide for views of the Bay by motorists using the bridge.

Guard rails and hand rails should be designed to provide maximum transparency for maintaining views of the Bay while meeting appropriate safety criteria.

Landscaping around the bridge should replicate the existing natural surroundings of the Bay shoreline.

Night lighting of and on the bridge is an important design consideration.

Environmental

The design should strive to minimize impact to the bay and to Yerba Buena Island (YBI)

The new span should be aligned to minimize, and mitigate impacts on sensitive wetland areas in the Emeryville Crescent.

The design should minimize bay fill and dredging.

Design and construction impacts on wildlife should be minimized and mitigated — many species of wildlife could be impacted by this project including the peregrine falcon, winter-run Chinook salmon, double-crested cormorant, least tern, clapper rail, pacific herring, and harbor seal. Removal of the nesting sites during selected times of the year will impact the birds, dredging during selected times of the year may impact the fish, and boat access may impact the harbor seals. Additionally, nesting sites for both the peregrine falcon and the double-crested cormorant should be sustained on or near the new span.

Replacement bridge foundation locations should, to the extent feasible, avoid known prehistoric, potential historic archaeological sites and historic properties on YBI. The ramps connecting the bridge to YBI should have the minimum impact on the natural features and landscape of the island.

Highway design standards

The following geometrics on the bridge roadway will be maintained:

- design speed of 100 kilometers per hour (65 miles per hour)
- maximum allowable deck grade of 2.74% (the existing maximum grade)
- minimum horizontal curve radius on mainline of 1000 meters (3000 feet) (based upon stopping sight distance (SSD) and is function of 3 meter shoulders — this number maybe modified depending on final determination of shoulder widths)
- minimum right side shoulder width of 3 meters (10 feet)
- lane width of 3.6 meters (12 feet)
- inside to inside of railings of a roadway with a 3 meter right shoulder and a 1.2 meter left shoulder (left shoulder subject to final determination) without a ped-bike lane is 22.2 meters and with a ped-bike lane is 26.4 meters (including 0.6 meters to construct a barrier between the roadway and ped-bike lane)
- maximum superelevation rate of 0.04 meters/meter for a 1000 meter curve
- the stopping sight distance (SSD) is 190 meters as a function of a 100 kilometers per hour speed
- minimum vertical curve length of (2V) in which V equals the design speed

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Night lighting of and on the bridge is an important design consideration.

- minimum horizontal clearance of 3 meters (10 feet) (which may change dependent on final determination of shoulder widths
- minimum vertical clearance of 5.1 meters (16.5 feet).

The following geometrics on the bridge ramps will be maintained (conforming to the island may cause some compromises of these standards):

- minimum design speed at an exit nose 80 kilometers per hour (50 miles per hour)
- minimum design speed at a terminus of 40 kilometers per hour (25 miles per hour)
- lane widths of 3.6 meters (12 feet)
- right shoulders of 2.4 meters (8 feet)
- left shoulders of 1.2 meters (4 feet)
- Stopping Site Distance of 130 meters (430 feet) as a function of a 80 kilometers per hour speed (50 miles per hour
- maximum allowable deck grade on a ramp of 8%
- maximum superelevation of 12% for a curve radius equal to or less than 190 meters (625 feet)

Pedestrian-bikeway design standards

If included, the two-way pedestrian-bikeway will follow the following standards:

- be compliant with Americans with Disabilities Act (ADA) regulations
- be separated from motorized traffic by a barrier
- minimum width of paved path from barrier to barrier of 3.6 meters (12 feet)
- minimum vertical clearance of 2.5 meters (8 feet)
- minimum bicycle path design speed of 40 kilometers per hour (20 miles per hour).

Any bicycle and pedestrian way should be integrated into the bridge design so that it contributes to the overall order and continuity of the bridge design. Periodic outlooks should be provided at intervals along the bicycle-pedestrian way.

Maintainability

Long term maintenance must be considered. The selection of structure type, a variety of potential system components, and structure materials should consider necessary maintenance programs and evaluate the likelihood of such programs receiving necessary consistent funding.

Maintainable thermal expansion joints will be required but should be at a maximum spacing consistent with bridge movement.

Maj - p/s. Handle

Manabu Ito

Dr. Eng. Professor Emeritus
The University of Tokyo

April 20, 1998

Mr. Steve Heminger
Manager, Legislation & Public Affairs
Metropolitan Transportation Commission
Joseph P. Bort Metro Center
101 Eighth Street
Oakland, CA 94607-4700
USA

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Dear Mr. Heminger :

Thank you for your sending me the agenda for April 15 meeting of EDAP for the Bay bridge Replacement and the draft record of the previous meeting. It was regrettable for me to be unable to attend the past meetings this year.

Pam

As I informed you previously, I may be able to attend the next EDAP meeting on May 29, 1998, on my way back from Brasil. Concerning this meeting, may I ask your favor on the following :

1. The notice of the meeting is always too late for me living overseas. In the coming May, I have to leave Japan on May 23 for Brasil to attend an international meeting. So, please notify the date, time and venue of the meeting, even unofficially, by the middle of the month. You can use fax or e-mail (ito-manabu@amy.hi-ho.ne.jp)
2. On Friday, May 29, I expect to arrive San Francisco at around 10 am from South America. So, I will be fortunate if the meeting is held in the afternoon. — 1-5 p.m.
3. If possible, I should like to have just rough sketches (perspective or general view) of the alternative designs presented at the recent meetings in advance.

Fax agenda for 5/29

Apologizing to you for my straightforward requests and thanking you in advance for your kind consideration.

With best regards.

Sincerely yours,

M. Ito

Manabu Ito, Member of EDAP

Also fax prints of the 2 single tower designs

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4/21/98

Dear Mr. Ito:

In response to your fax of April 20, we are pleased you may be able to attei

At this point, we do not have an agenda for the meeting, but we do know it
1 p.m. and will be held in the MetroCenter Auditorium, 101 8th Street, Oakla

We will soon have new photos of the most recent proposed designs of the b

Please let us know if you need anything else, and we will look forward to se

Sincerely,
Marj Blackwell
(for Steve Heminger)